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LONGEVITY OF BUPRESTIS IN DOUGLAS-FIR

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During the past 40 years there has been considerable speculation on how long it takes Buprestis aurulenta to mature from the egg to the adult in airdry wood. On circumstantial evidence it has been surmised that individual larvae live 10, 20, 30, or more years.

Today Mr. Coulter and I can report that Buprestis aurulenta definitely does live at least 15 years in airdry wood and a related species, B. langi, 14 years. The indications are that both may take 25 to 30 years, and probably longer to mature under such conditions. Before giving our evidence, a few words concerning the habits of Buprestis and the method of rearing may be of interest.

Here in the Northwest we have several species of Buprestis. They are the well-known flat-headed borers. Two of them, Buprestis aurulenta and B. langi, commonly attack coniferous wood products, principally Douglas-fir and ponderosa pine. In the past 20 years, more than 200 such cases have been reported to us. The beetles emerge from practically any part of a house or other wooden structure. In most cases the damage is slight, but wooden storage tanks have been seriously damaged.

Buprestis often emerges from houses 10 to 30 years old. Adults have emerged from furniture many years after it was shipped to areas where Buprestis is not native. From this circumstantial evidence, it has been concluded that the beetles had been present in the wood since the time of construction. It has also been speculated that in some cases the eggs are laid in buildings after construction. Some observers have suggested that the beetles rear successive generations in infested buildings.

In 1939 we thought it would be a good idea to find out how long Buprestis actually does live in dry lumber. We are still at it, and still don't have the final answer. We do know that both B. aurulenta and B. langi live a long time in dry wood.

We soon found that these beetles oviposit abundantly in stacks of newly sawn lumber. We also observed oviposition in unpainted lumber in water tanks. We found that egg laying could be induced in the laboratory and first instar larvae readily obtained. The technique was simple. Field-collected adults were fed Douglas-fir foliage or sugar solution. Then, at rather high temperatures, the females laid eggs between splinters of Douglas-fir wood in glass jars. The eggs hatched in about one month.

We also worked with Buprestis rusticorum. That species laid its eggs only under bark and would not become established in sawn lumber. We have no record of its emerging in houses.

The 1st instar larvae of Buprestis aurulenta and B. langi were introduced individually into blocks of Douglas-fir wood about 1/2" x 3" x 4". The wood was mostly heartwood. Periodically the blocks were cut open and the larvae measured and introduced into a new set of blocks. The last time this was done was this month.

The blocks are exposed to three sets of conditions: (1) laboratory, essentially the same as inside a house; (2) insectary, where they are subject to outside temperatures and atmospheric moisture, but no wetting or direct sunshine; and (3) screen cages, where they are exposed to the elements.

We started with 850 larvae and are now down to 48. Forty of them are Buprestis aurulenta (17% survival). Seven have lived 15 years, 12 - 14 years and 21 - 13 years. They range in length from 4 to 25 mm.

Eight are Buprestis langi (1% survival). One has lived 14 years and 7 - 13 years. They range in size from 3 to 9 mm. It is evident that B. langi doesn't make out as well under these conditions as B. aurulenta. This bears out general observations, because B. langi also is reported from buildings much less frequently.

It should be borne in mind that the first instar larva of both species is about 2-1/2 mm long and the mature larva about 35 mm. Many of the larvae haven't put on much weight in 13 to 15 years. Some have increased only 1/2 mm in length during this period. If they live to maturity, it is certain they have many years to go.

In 1942, we wondered whether the large larvae of Buprestis would survive our method of handling. Several large larvae, probably B. aurulenta, were collected in the wild. One of them still survives after 12 years. It was 25 mm long in 1942 and it's 22 mm long now. It appears to be approaching maturity in a rather negative way.

Since only one of the larvae reared from the egg has attained a length of 25 mm in 15 years, and one larva, starting out at 25 mm, has not yet matured, the two periods might be combined for a total of 27 years, and still no adults.

This raises the question of how rapidly Buprestis will mature. One year has been given in the literature. We're inclined to doubt that statement. Here in the sunny pine country of eastern Oregon, Buprestis emerges from pine stumps 5 or 6 years after logging, but the attacks could have occurred in cat-faced areas before the trees were felled. In houses 8 to 10 years is about minimum for emergence. We feel, without proof, that 5 to 6 years is minimum under any conditions.

In summary, we know definitely that individual B. aurulenta and B. langi larvae live in dry wood up to 14 and 15 years. In 10 to 20 years we may be able to report exactly how long they take to mature. We hope to be around at that time to make the report and hope you will all be here to listen to it.